Trike Conversion Installation Guide

for

Yamaha Road Star Motorcycles

Excluding All Warrior Models

Revision 5

CAUTION : **Failure to follow these instructions can lead to serious personal injury and/or property damage and may void the warranty**

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Champion Trikes

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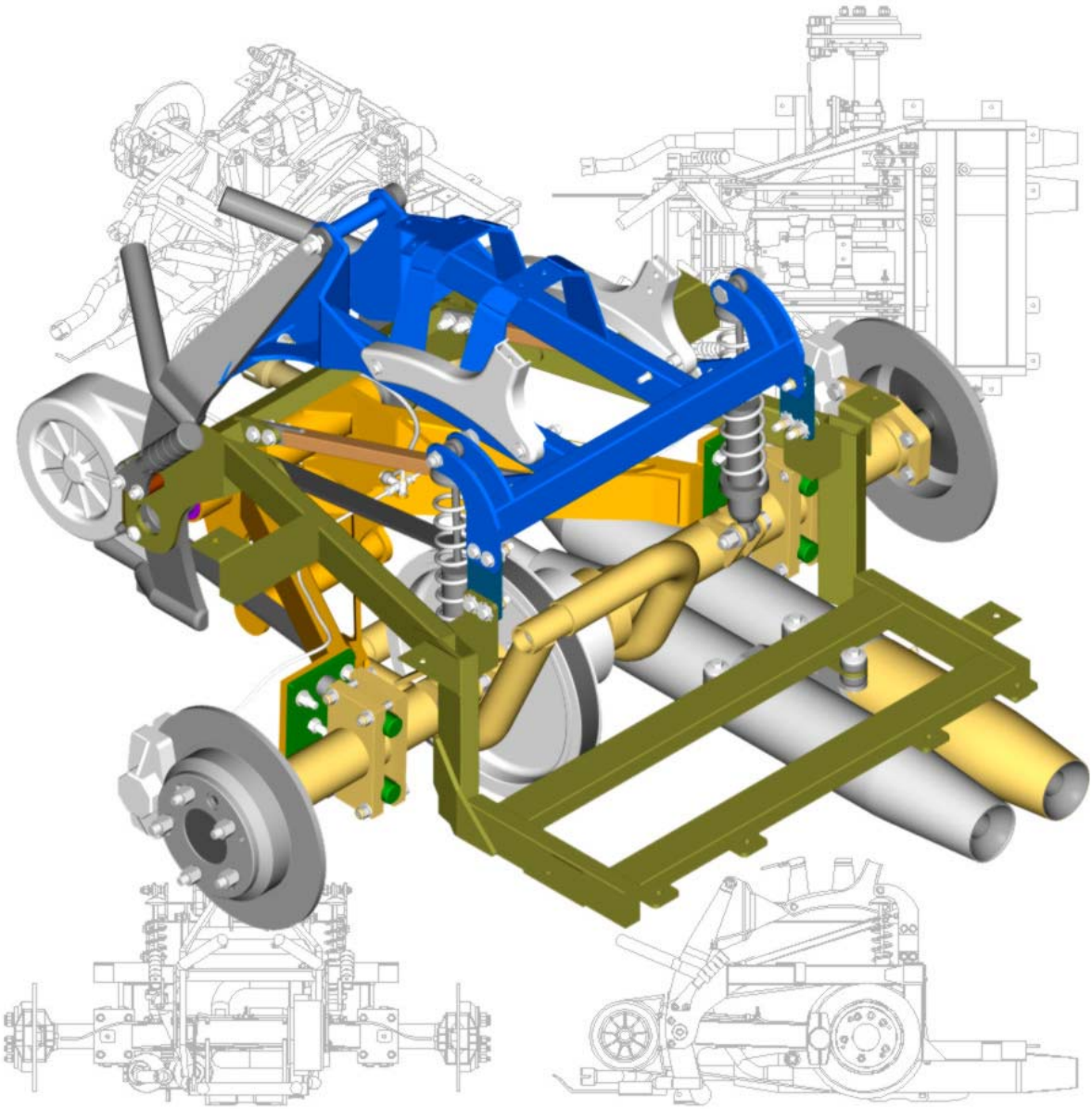

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1 General Information

The Champion Sidecars Trike Conversion Kit is designed with the utmost consideration to safety, quality and ease of installation. The kit comes complete with all necessary hardware and fasteners. However, it is assumed that the installer has advanced and/or professional skills in motorcycle servicing. It is recommended that installer obtain an OEM service manual for the vehicle to which the Trike Kit is to be installed.

1.1 Installation Information

The information contained in this Installation Guide is intended for use by technicians of advanced and/or professional skill levels. Attempting installation without the proper training, tools and equipment could cause injury to you or others. It could also damage the vehicle or cause an unsafe condition.

1.2 For Your Safety

Because this guide in intended for technicians of advanced to professional skill levels, we do not provide warnings about many basic shop safety practices. If you have not received shop safety training or do not feel confident about your knowledge of safety practices, we recommend that you do not attempt to perform the procedures described in this guide.

Some of the most important general safety precautions are given below. Champion Sidecars cannot warn you of every conceivable hazard that can arise. Only you can decide whether or not you should perform a given task.

1.3 Important Safety Precautions

a. **Make sure you have a clear understanding of all basic shop safety practices and that you wear appropriate clothing and use safety equipment. Be especially careful of the following**:

- Read all directions before you begin, and make sure you have the tools, the parts and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts.
- Protect yourself and others when you have a vehicle up in the air. Anytime you lift a vehicle, either by hoist or a jack, make sure that it is securely supported.

b. **Make sure the engine is turned off before you begin work.**

- Carbon Monoxide poisoning from exhaust gases: Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts: Let the engine and exhaust system cool before working on those areas.

2 Specifications

Overall Width:	54.25”
Overall Length:	103”
Wheel Base:	68.25”
Load Capacity:	500 Lb
Tire Size:	P215 / 60R / 15
Wheel Size (15”)	Offset +35 mm 15x7JJ 5x4.5
Tire Pressure	20 PSI

- Suspension:
  “Zero-Flex” Internal Swing Arm utilizing 3 shocks, OEM shock absorber plus 2 coil over shock absorbers.

- Rear Differential:
  Champion Light Weight Rear Differential Assembly.

- Brakes:
  Original front plus 2 high performance disc brakes at rear.

- Storage Capacity:
  3.75 cubic feet. 2 full-face helmets and additional over wheel storage.

3 Removal of Original Parts

a. Disconnect the battery.

b. Secure and raise the motorcycle 9 to 10 inches using a quality motorcycle lift.

c. Remove the following from the vehicle. See OEM manual for detailed instructions. Items to be retained for re-installation after modification are noted.

- Rider's Seat (to be re-installed without modification)
- Passenger Seat (to be reinstalled without modification)

NOTE: OEM front / rear seat mount bracket and rear seat mounting bolt to be retained and reused.

- Passenger Back Rest w/ Mounting Rails (to be re-installed without modification)

NOTE: Back rest to mounting rail hardware to be reused. Mount rail to vehicle frame not to be reused.

- Left and right passenger foot rests (to be re-installed without modification)
- Drive Pulley / Belt cover (to be re-installed without modification)
- Mufflers (to be re-installed and relocated with minor modification)
- Rear Fender (complete w/ sub frame and all attaching parts)

NOTE: Upper Forward Fender Mounting Bolt to be retained and reinstalled.

- Shock Absorber to Swing Arm Mounting Bolt (to be re-installed)
- Swing Arm and Rear Wheel (complete w/ all attaching parts)

NOTE: Swing Arm Pivot Bolt, washer and nut to be retained and reinstalled.

- Brake Line to Rear Master Cylinder
- Drive Belt

Core Return

There are *NO* core return parts for this model.

4 Installation of Champion Trike Conversion Kit

4.1 Install Drive Belt

a. Install supplied drive belt to transmission output pulley. (Refer to OEM manual) **Figure 1**

b. Drive belt cover to be reinstalled later.

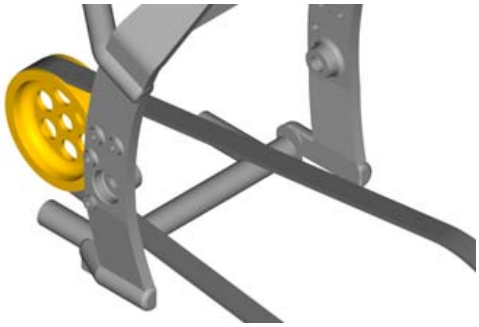


Figure 1

4.2 Install Champion Swing Arm

a. Install Champion Swing Arm to vehicle using the OEM pivot bolt, washer and nut. **Figure 2**

b. Attach OEM shock absorber to swing arm using OEM hardware.

c. Torque pivot bolt nut to 90 lb. ft.

d. Torque lower shock hardware to 43 lb. ft.

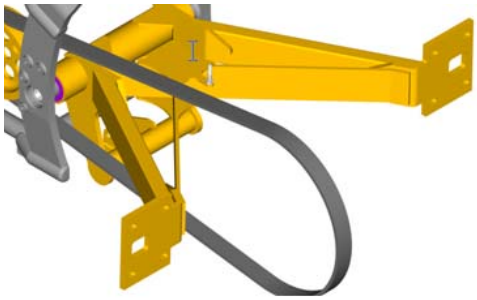


Figure 2

4.3 Install Rear Drive Assembly

a. Install tension bolts and jam nuts to adjuster plates. **Figure 3**

Qty per Assm	Spec	Description
2	M10 x 1.25 x 70	Hex Head Bolt
2	M10 x 1.25	Hex Nut

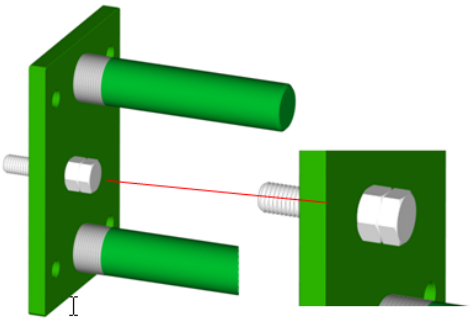


Figure 3

b. Install adjuster plates to rear drive pinch blocks. Hardware installs from inboard to outboard side. Snug, but do not tighten hardware at this time. **Figure 4**

Qty per Assm	Spec	Description
6	3/8-24 x 2-3/4	Hex Head Bolt
2	3/8-24 x 2-1-2	Socket Head Cap Screw
14	3/8	SAE Flat Washer
8	3/8-24	NyLoc Nut

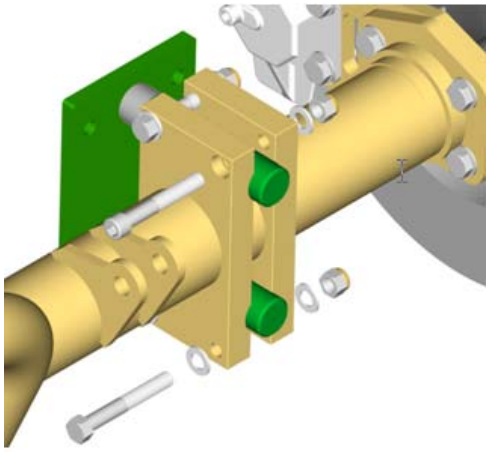


Figure 4

c. Position the rear drive assembly through the drive belt and behind the swing arm, supporting both ends with jack stands or other suitable method. **Figure 5**

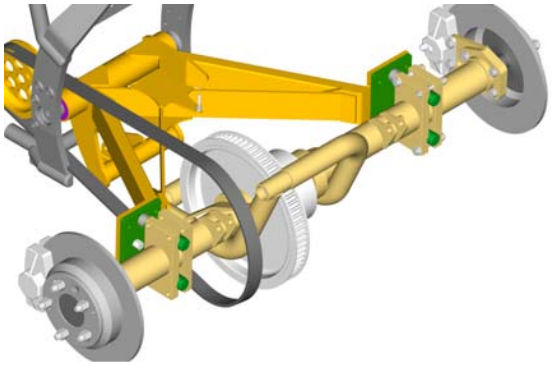


Figure 5

d. Remove the two bolts (use 5/8" Allen wrench) securing the left and right halves of the rear drive assembly together. **Figure 6**

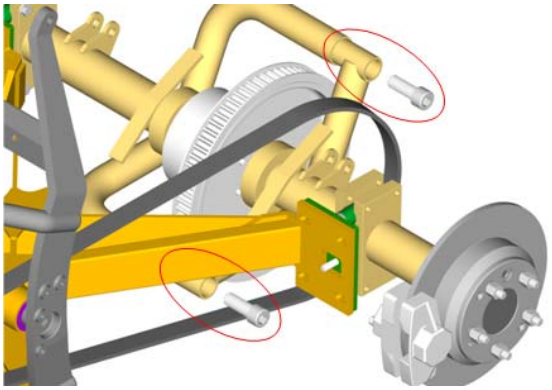


Figure 6

e. Rotate the left side assembly counter clockwise enough to allow the drive belt to pass. Place the belt to the inside of the rear drive pulley. **Figure 7**

f. Realign the rear drive assembly halves and replace the bolts. Torque to 100 ft. lbs.

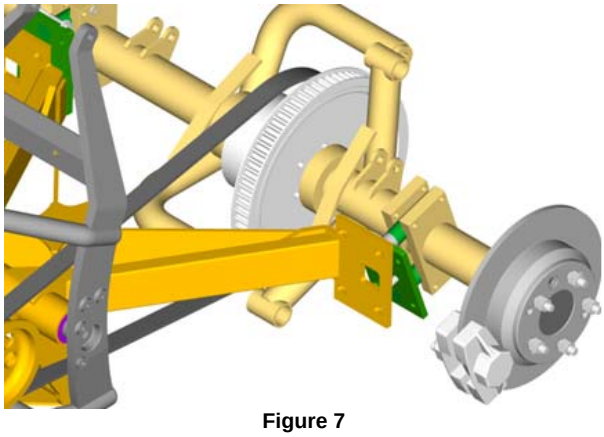


Figure 7

g. Install hardware securing adjuster plates to the swing arm. Hardware installs from front to back. Snug, but do not tighten hardware at this time. **Figure 8**

Qty per Assm	Spec	Description
8	3/8-24 x 1-1/2	Hex Head Bolt
16	3/8	SAE Flat Washer
8	3/8-24	NyLoc Nut

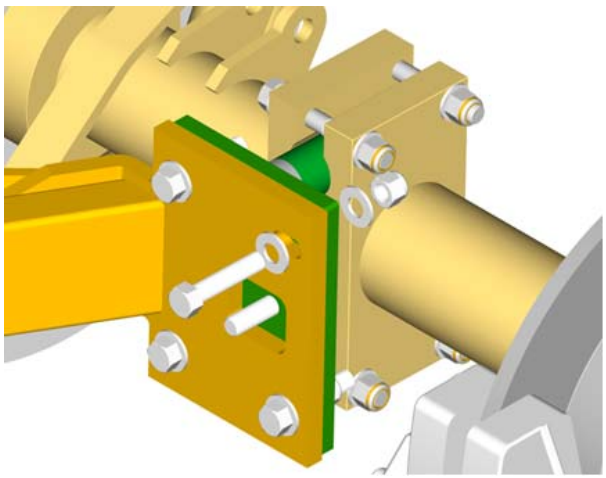


Figure 8

h. Place drive belt onto / around rear pulley.

i. With hardware snug and front and rear pulleys laterally aligned, set belt tension with the tensioners located on each adjuster plate (See OEM manual for belt tension specification). **Figure 9**

j. Ensure by measurement that the distance between the adjuster plates and pinch blocks is the same on both ends of the differential assembly. **Figure 9**

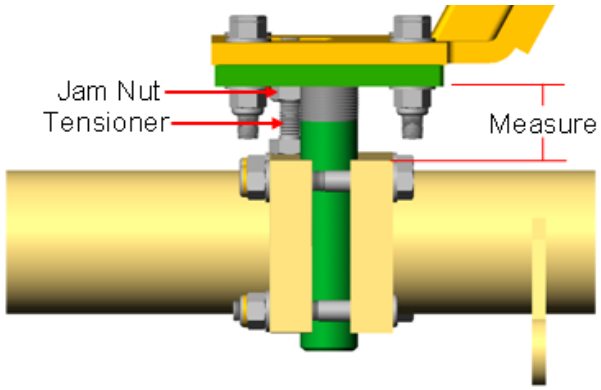


Figure 9

k. Check belt alignment by rotating the rear pulley forward and backward and observing the tracking of the belt within the pulley guides. If belt “walks” to one side, turn the tensioner on that side counter clockwise (lengthen) slightly and recheck alignment. **Figure 10**

l. Once correct belt tension and alignment is achieved, tighten tensioner jam nuts, adjuster plate and pinch block hardware.

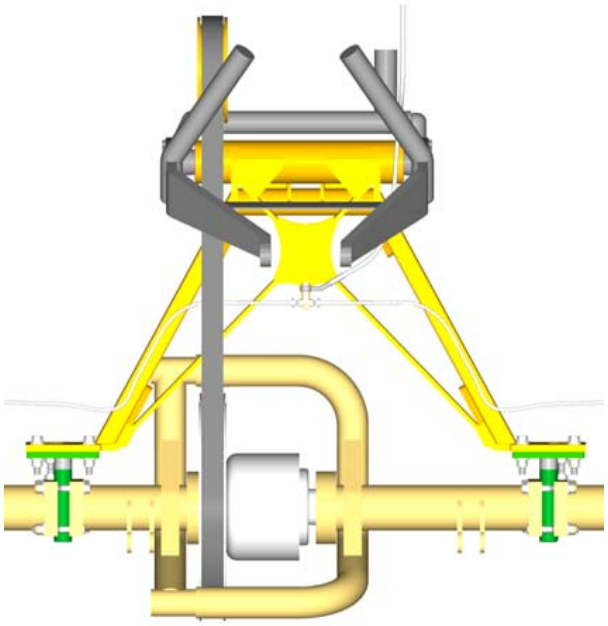


Figure 10

4.4 Install Brake Lines

a. Install brake tee fitting to swing arm with supplied ¼-20 NyLoc nut. **Figure 11**

b. Install brake lines between tee fitting and calipers. Secure lines to swing arm using supplied zip ties. **Figure 11**

c. Install 30° fitting end of 50" braided brake line to the brake tee using supplied M10 x 1 banjo bolt and two crush washers. Route the brake line over swing arm pivot tube, then along OEM routing to rear master cylinder. **Figure 11**

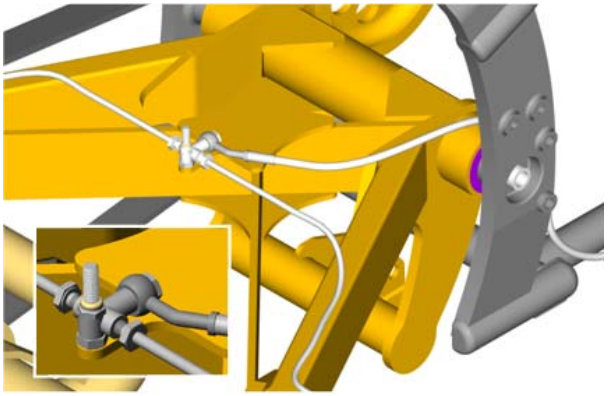


Figure 11

d. Install 90° fitting end of 50" braided brake line and supplied residual valve and three crush washers to rear brake master cylinder using OEM banjo bolt (one crush washer between each component and master cylinder). **Figure 12**

e. Bleed rear brake system.

Figure 12

4.5 Install Seat / Shock Mount

a. Position the seat / shock mount between the "horns" of the vehicle frame. Install the OEM fender mounting bolt between horns and through seat / shock mount. **Figure 13**

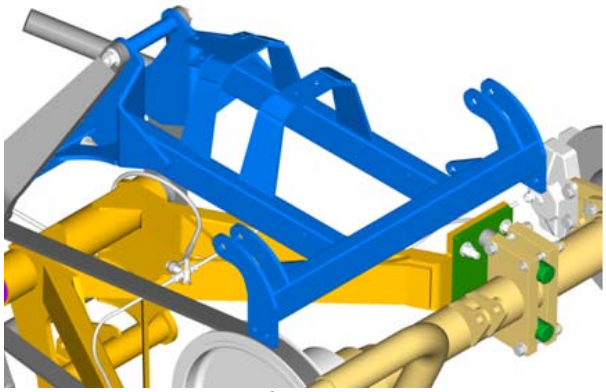


Figure 13

b. Install hardware through vehicle frame and seat / shock mount as shown. **Figure 14**

Qty per Assm	Spec	Description
2	M10 x 1.25 x 45	Hex Head Bolt
4	M10	Washer
2	M10 x 1.25	NyLoc Nut

c. Tighten all shock / seat mount hardware. Torque upper hardware (at “horns”) to 64 lb. ft.

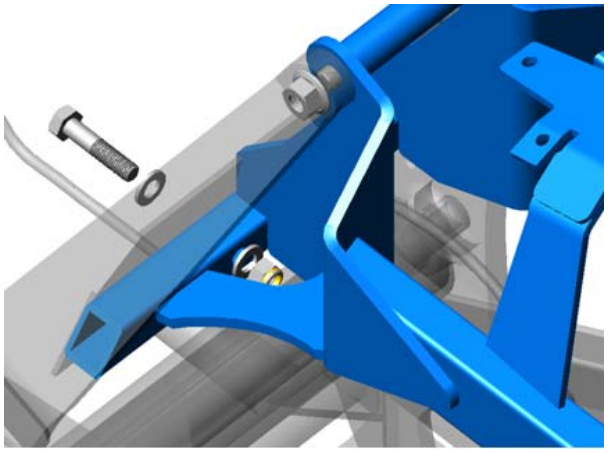


Figure 14

4.6 Install Body Frame

a. Replace drive pulley / belt cover to vehicle transmission.

b. Position body frame to vehicle. **Figure 15**

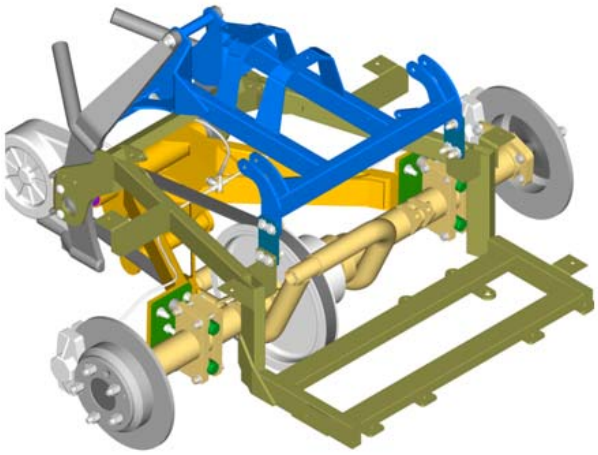


Figure 15

c. Install hardware as shown. Ensure engine side plates are between vehicle frame and body frame plates. Do not tighten at this time. **Figure 16**

Qty per Assm	Spec	Description
4	M10 x 1.25 x 30	Hex Head Bolt
4	M10	Washer

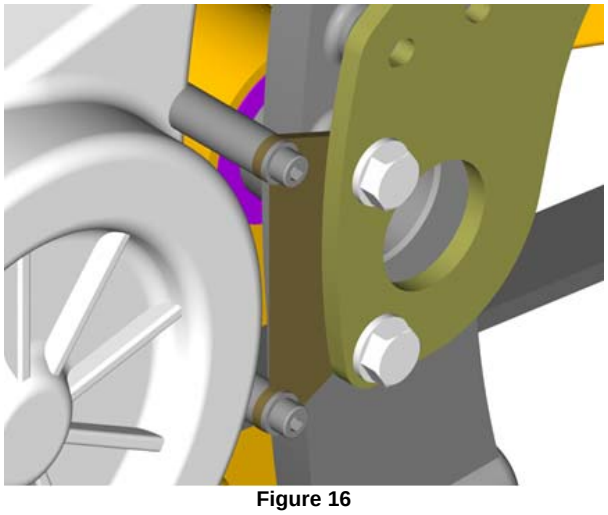


Figure 16

d. Install left and right body frame hanger plates between seat / shock mount and body frame as shown. **Figure 17**

Qty per Assm	Spec	Description
8	3/8-24 x 1-1/2	Hex Head Bolt
16	5/16	USS Flat Washer
16	3/8	Star Lock Washer
8	3/8-24	NyLoc Nut

e. Tighten all body frame hardware.

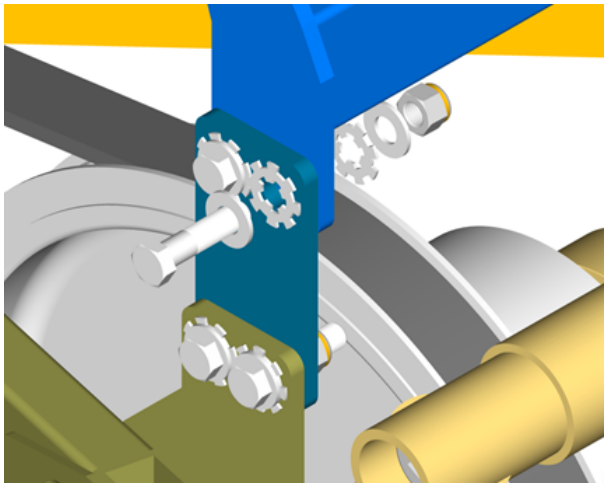


Figure 17

4.7 Install Support Struts

a. Install left and right support struts between seat / shock mount and body frame as shown. Struts mount inboard of upper and lower tabs. **Figure 18**

Qty per Assm	Spec	Description
8	3/8-24 x 1-1/4	Hex Head Bolt
16	5/16	USS Flat Washer
8	3/8-24	NyLoc Nut

b. Tighten hardware.

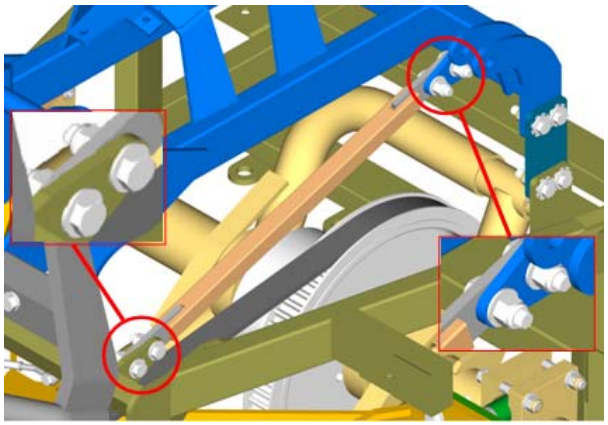


Figure 18

4.8 Install Shock Absorbers

a. Install shock absorbers between seat / shock mount and rear differential assembly as shown. Note orientation (direction) of hardware. **Figure 19 /Figure 20**

Qty per Assm	Spec	Description
4	½-20 x 2-1/4	Hex Head Bolt
8	Heim Spacer	Heim Spacer
8	½	SAE flat Washer
4	½-20	NyLoc Nut, Thin

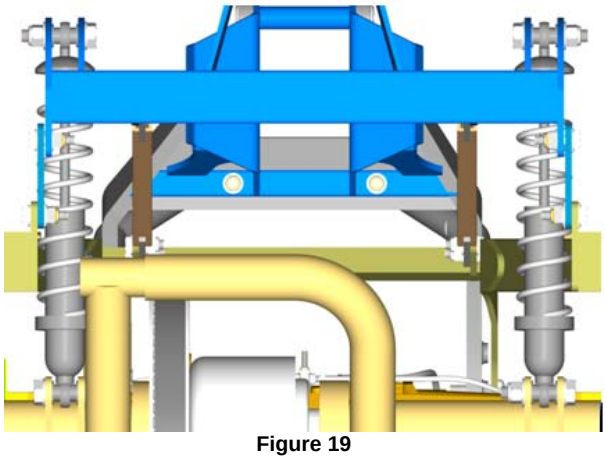


Figure 19

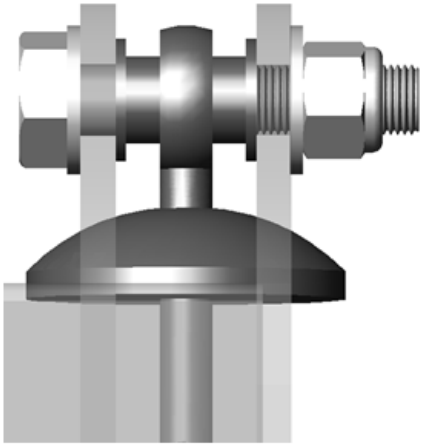


Figure 20

4.9 Muffler Modifications / Exhaust Installation

Note: Exhaust to be remounted with mufflers side by side. The mount side of the muffler assembly now becomes the ***bottom*** of assembly.

a. Install muffler extension to the right muffler as shown. **Figure 21**

Qty per Assm	Spec	Description
1	¼-28 x 1	Socket Head Cap Screw
1	¼-28	NyLoc Nut

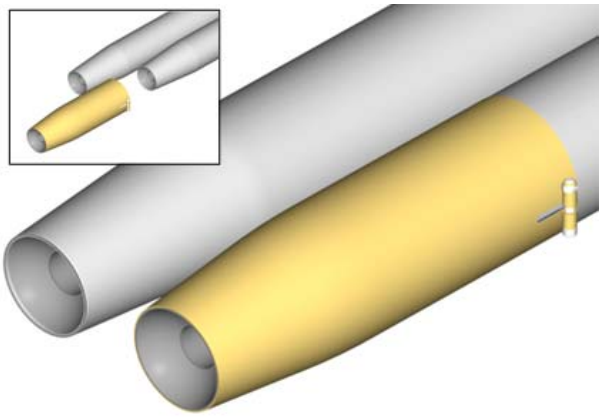


Figure 21

b. Drill three 1/16” holes in the bottom of each muffler, in the approximate locations shown, to provide moisture drainage. **Figure 22**

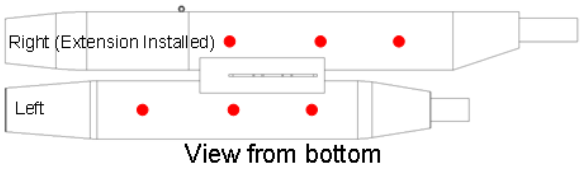


Figure 22

c. Install the muffler hanger bracket to the body as shown. **Figure 23**

Qty per Assm	Spec	Description
3	5/16-18 x 2	Hex Head Bolt
3	5/16	Dome Washer
6	-	Vibration Damper
3	5/16	SAE Flat Washer
3	5/16-18	NyLoc Nut

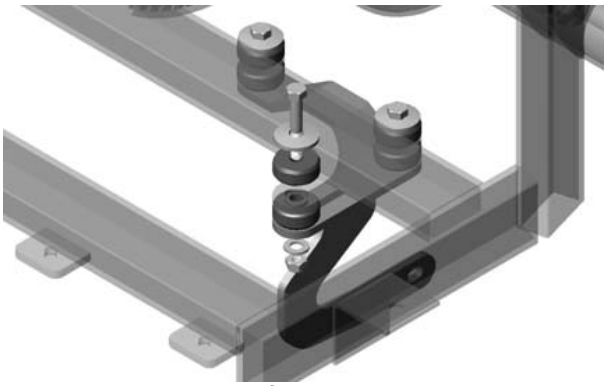


Figure 23

4.10 Position Muffler onto Hanger

a. Position muffler assembly onto exhaust hanger as shown. Position the vertical tab to the muffler mount inboard of the hanger arm (illustration view from bottom right). **Figure 24**

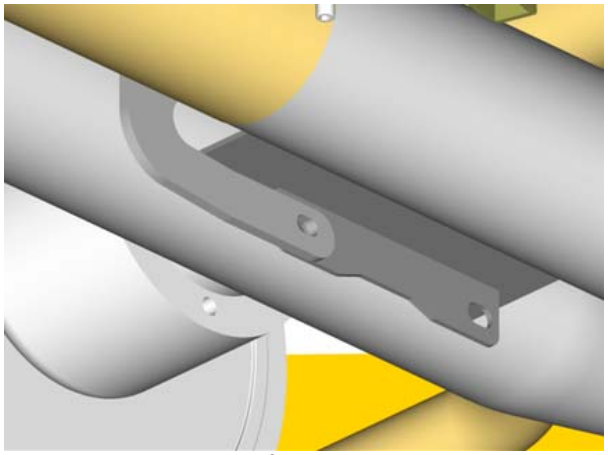


Figure 24

b. Install supplied exhaust tubing and clamps between mufflers and OEM exhaust pipes. Do not tighten clamps at this time. **Figure 25**

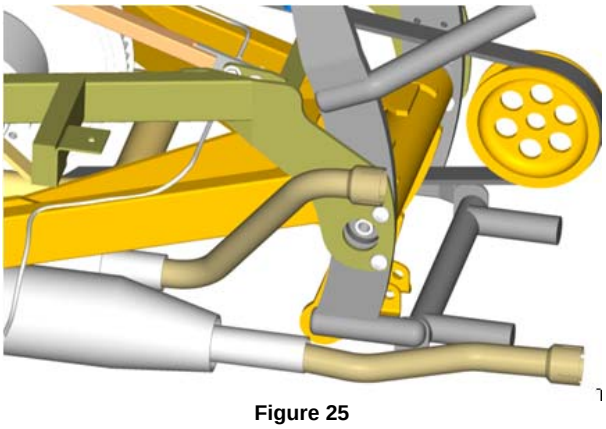


Figure 25

c. Position hardware to muffler assembly and hanger as shown. Do not tighten. **Figure 26**

Qty per Assm	Spec	Description
1	3/8-24 x 1	Hex Head Bolt
2	3/8	SAE Flat Washer
1	3/8-24	NyLoc Nut

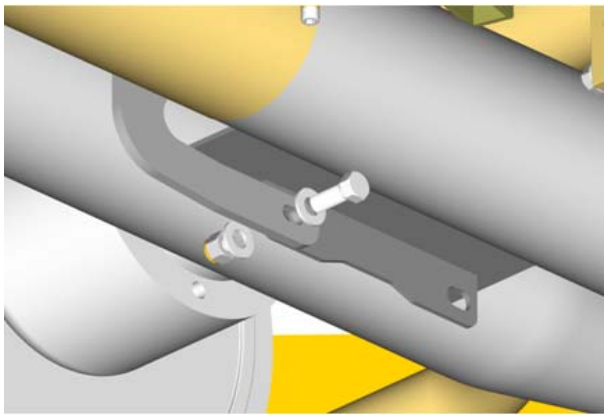


Figure 26

d. Return to exhaust tubes. Align mufflers, exhaust tubes and exhaust pipes.

e. Tighten all exhaust tubing clamps.

f. Tighten hardware securing muffler assembly to hanger.

g. Install chrome covers to exhaust tubes using supplied clamps. Tighten securely. **Figure 27**

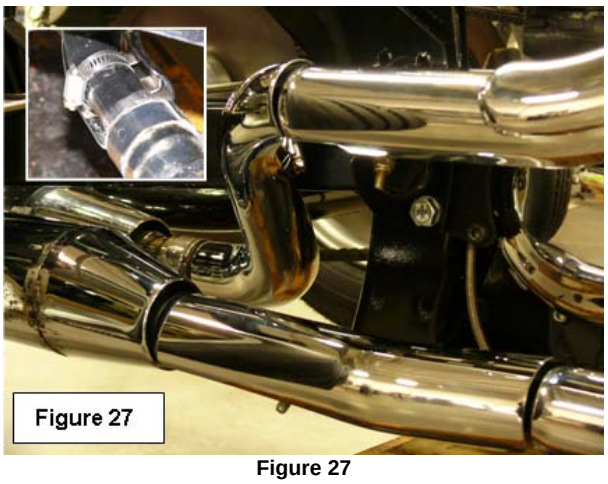


Figure 27

4.11 Install OEM Back Rest Brackets

a. Install left and right passenger back rest brackets to the seat / shock mount as shown. **Figure 28**

Qty per Assm	Spec	Description
4	5/16-24 x 2-3/4	Hex Head Bolt
8	5/16	SAE Flat Washer
4	5/16-24	NyLoc Nut

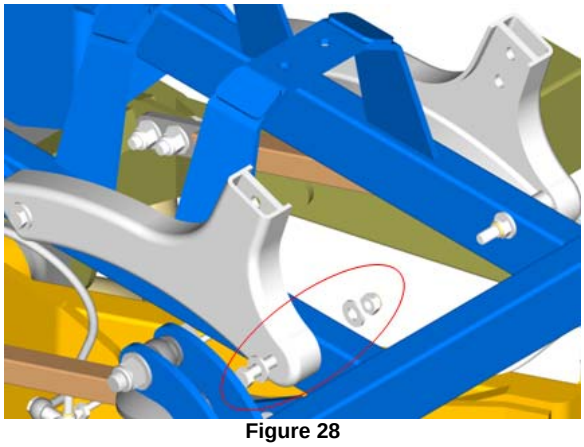


Figure 28

4.12 Install Body

a. Temporarily install wheels to rear differential assembly.

b. Carefully position body onto body frame. **Figure 29**

Figure 29

c. Connect trike body electrical harness to OEM harness. **Figure 30**

Figure 30

d. Route green and yellow and black wires as shown. Connect black wire to the Negative terminal of the battery. Strap resistors to bike frame as shown. **Error! Reference source not found.**

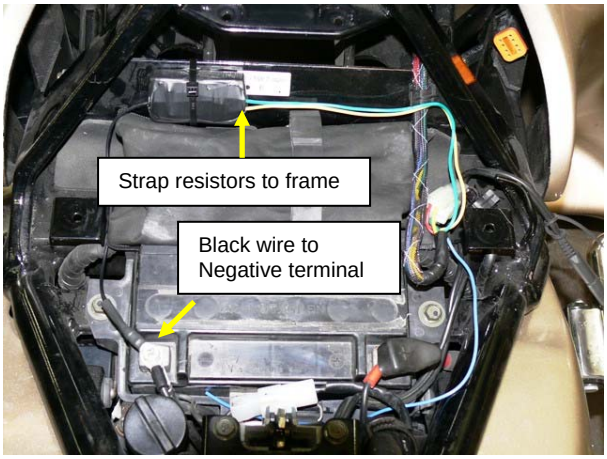


Figure 31

e. If interior trunk light option was purchased, or power needs to be supplied to the blue wire on the trailer hitch, the following options are available to supply power :

- Option 1: connect blue wire to battery positive (In line fuse recommended)
- Option 2: connect blue wire to running lights (brown wire)

f. Connect battery and check electrical system operation. Disconnect battery when complete.

g. Locate the four holes predrilled into trike body. Align with corresponding body frame tabs and install hardware. Check body alignment and tighten hardware.

Qty per Assm	Spec	Description
6	3/8-24 x 1-1/4	Hex Head Bolt
6	3/8	Fender Washer
6	3/8	SAE Flat Washer
6	3/8-24	NyLoc Nut

NOTE: Fender washers against fiber glass side, flat washers against steel.

h. Remove wheels. Locate the left and right center body mount tabs and drill a 3/8” hole up through tabs and body (tab is pre-drilled)

i. Install remaining hardware.

5 Install Front / Rear Seat Mount Tab

a. Install the rear seat mount tab to the rear loop to the seat / shock frame. **Figure 32**

Qty per Assm	Spec	Description
2	5/16-18 x 1	Button Head Allen Bolt
4	5/16	SAE Flat Washer
2	5/16-18	NyLoc Nut

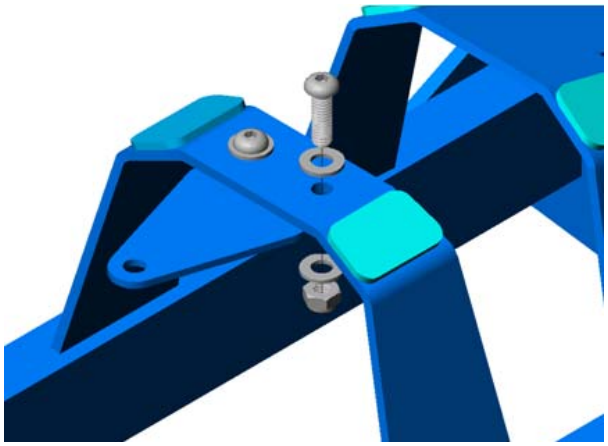


Figure 32

b. Install OEM front / rear seat catch bracket to seat /shock mount as shown. **Figure 33**

Qty per Assm	Spec	Description
3	1/4-20 x 7/8	Hex Head Bolt
6	1/4	SAE Flat Washer
3	1/4-20	NyLoc Nut

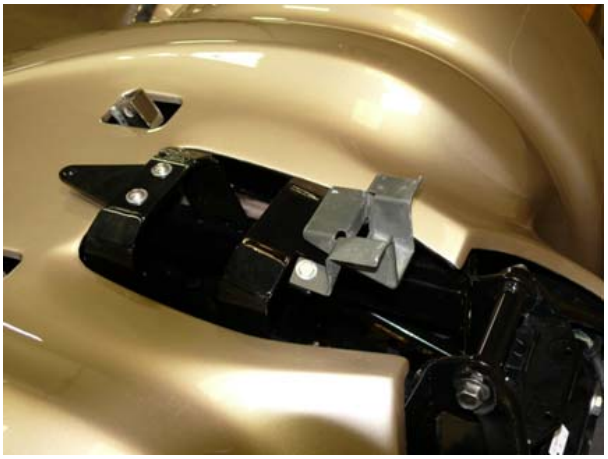


Figure 33

5.1 Install Passenger Foot Pegs / Boards

a. If reinstalling OEM passenger foot pegs, use supplied hardware and spacers as shown. **Figure 34**

Qty per Assm	Spec	Description
4	M8 x 1.25 x 50	Socket Head Cap Screw
4	M8	Flat Washer
4	¾ OD x 1 Long	Spacer

b. OEM or aftermarket foot boards install with supplied hardware.

Qty per Assm	Spec	Description
4	M8 x 1.25 x 35	Socket Head Cap Screw
4	M8	Flat Washer

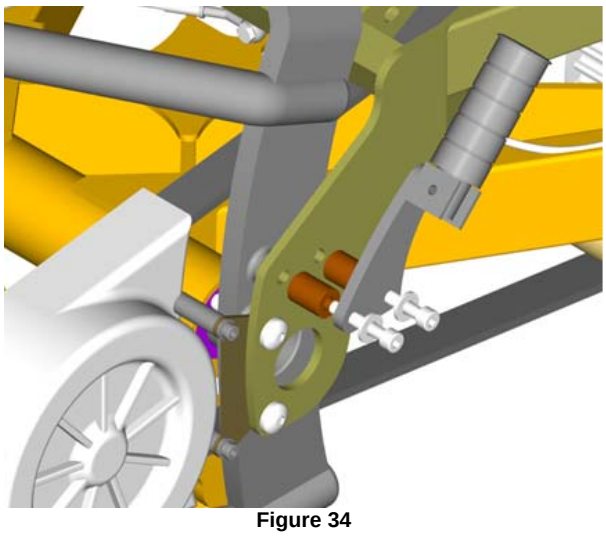


Figure 34

5.2 Install Passenger Back Rest

a. Install passenger back rest using OEM hardware. **Figure 35**

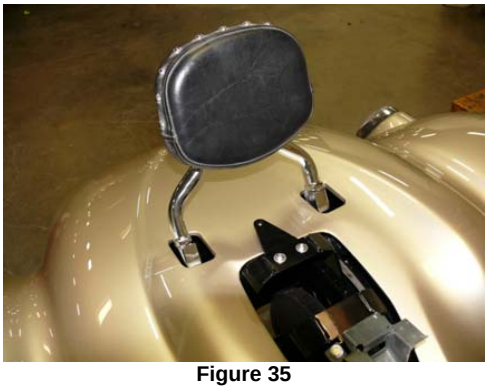


Figure 35

5.3 Install Rider and Passenger Seats

a. Connect battery cables.

b. Install rear seat using OEM bolt. **Figure 36**

c. Install rider seat. **Figure 36**

Figure 36

5.4 Install Wheels

a. Install wheels to rear differential assembly. **Figure 37**

b. Torque lug nuts to 75 lb. ft.

Figure 37

c. Install OEM swing arm pivot bolt covers to body frame plate holes. **Figure 38**

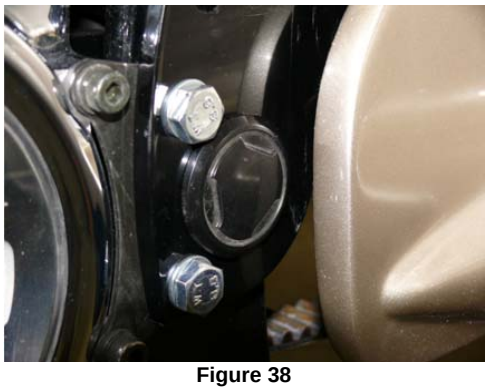


Figure 38

5.5 Install Trailer Tongue (Optional)

a. Install tongue to receiver on Trike Body Frame

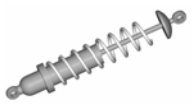
b. Electrical connectors not supplied. Mounting tab for connector socket is located on hitch receiver.

c. Color code for wiring as follows: (Confirm wiring by testing)

Old Harness		New Universal Harness (From Mid 2007)
Running lights	BLUE	BROWN
Brake lights	RED	RED
Turn signal, right	GREEN	GREEN
Turn signal, left	YELLOW	YELLOW
Accessory	LIGHT BLUE	BLUE
Ground	BLACK	BLACK

6 Part List

Part Illustration	Description	Part #	Qty per Veh	Page
	Drive Belt, Narrow 139 Tooth	CH-F00-033	1	4.1
	Swing Arm	SU-K00-001	1	4.1
	Rear Drive Assm, Complete	DL-K00-001	1	4.1 - 4.3
	Adjuster Plate, L / RHS	SU-F00-005	2	4.2 - 4.3
	Seat / Shock Mount	SU-K00-003	1	4.4
	Body Frame	SU-K00-002	1	4.4 - 4.5
	Residual Valve (3 lb)	BR-E00-018	1	4.4
N/A	Tee Fitting, Rear Brakes	BR-EF0-002	1	4.4
N/A	Brake Line, SS Braided 50”	BR-F00-006	1	4.4
N/A	Brake Line, SS Braided 20”	BR-F00-001	2	4.4
	Hanger Plate	SU-K00-008	2	4.5

Part Illustration	Description	Part #	Qty per Veh	Page
	Support Strut	SU-K00-007	2	4.6
	Coil Over Shock Absorber	SU-E00-001	2	4.7
	Muffler Tip	CH-K00-001	1	4.7
	Exhaust Hanger	SU-K00-006	1	4.8
	Exhaust Tube, Lower	CH-K00-004	1	4.9
	Exhaust Tube, Upper	CH-K00-002	1	4.9
	Cover, Upper Exhaust Tube	CH-K00-003	1	4.9
	Cover, Lower Exhaust Tube	CH-K00-005	1	4.9
	Rear Seat Mounting Bracket	SU-K00-009	1	4.11
	Spacer, Foot Rest Mount	CH-E00-015	4	4.11

7 Hardware List

Pinch Blocks			
Qty per Assm	Spec	Description	Part Number
6	3/8-24 x 2-3/4	Hex Head Bolt	HW-375-056
2	3/8-24 x 2-1-2	Socket Head Cap Screw	HW-375-060
14	3/8	SAE Flat Washer	HW-375-016
8	3/8-24	NyLoc Nut	HW-375-011

Adjuster Plates			
Qty per Assm	Spec	Description	Part Number
2	M10 x 1.25 x 70	Hex Head Bolt	HW-M10-011
2	M10 x 1.25	Hex Nut	HW-M10-009
8	3/8-24 x 1-1/2	Hex Head Bolt	HW-375-006
16	3/8	SAE Flat Washer	HW-375-016
8	3/8-24	NyLoc Nut	HW-375-011

Seat Shock Mount			
Qty per Assm	Spec	Description	Part Number
2	M10 x 1.25 x 45	Hex Head Bolt	HW-M10-025
4	M10	Washer	HW-M10-005
2	M10 x 1.25	NyLoc Nut	HW-M10-022

Body Frame			
Qty per Assm	Spec	Description	Part Number
4	M10 x 1.25 x 30	Hex Head Bolt	HW-M10-010
4	M10	Washer	HW-M10-005

Body Frame Hangers			
Qty per Assm	Spec	Description	Part Number
8	3/8-24 x 1-1/2	Hex Head Bolt	HW-375-006
16	5/16	USS Flat Washer	HW-312-040
16	3/8	Star Lock Washer	HW-375-049
8	3/8-24	NyLoc Nut	HW-375-011

Support Struts			
Qty per Assm	Spec	Description	Part Number
8	3/8-24 x 1-1/4	Hex Head Bolt	HW-375-052
16	5/16	USS Flat Washer	HW-312-040
8	3/8-24	NyLoc Nut	HW-375-011

Shock Absorber			
Qty per Assm	Spec	Description	Part Number
4	½-20 x 2-1/4	Hex Head Bolt	HW-500-006
8	Heim Spacer	Heim Spacer	SU-DE0-001
8	½	SAE flat Washer	HW-500-020
4	½-20	NyLoc Nut, Thin	HW-500-034

Exhaust Hanger			
Qty per Assm	Spec	Description	Part Number
3	5/16-18 x 2	Hex Head Bolt	HW-312-023
3	5/16	Dome Washer	HW-375-061
6	-	Vibration Damper	SE-G00-001
3	5/16	SAE Flat Washer	HW-312-017
3	5/16-18	NyLoc Nut	HW-312-009

Muffler Extension			
Qty per Assm	Spec	Description	Part Number
1	¼-28 x 1	Socket Head Cap Screw	HW-250-024
2	¼-28	NyLoc Nut	HW-250-002

Muffler Mounting			
Qty per Assm	Spec	Description	Part Number
1	3/8-24 x 1	Hex Head Bolt	HW-375-042
2	3/8	SAE Flat Washer	HW-375-016
1	3/8-24	NyLoc Nut	HW-375-011

Back Rest Mounting Rails			
Qty per Assm	Spec	Description	Part Number
4	5/16-24 x 2-3/4	Hex Head Bolt	HW-312-036
8	5/16	SAE Flat Washer	HW-312-017
4	5/16-24	NyLoc Nut	HW-312-010

Body			
Qty per Assm	Spec	Description	Part Number
6	3/8-24 x 1-1/4	Hex Head Bolt	HW-375-052
6	3/8	Fender Washer	HW-375-007
6	3/8	SAE Flat Washer	HW-375-016
6	3/8-24	NyLoc Nut	HW-375-011

Rear Seat Mount Bracket			
Qty per Assm	Spec	Description	Part Number
2	5/16-18 x 1	Button Head Allen Bolt	HW-312-026
4	5/16	SAE Flat Washer	HW-312-017
2	5/16-18	NyLoc Nut	HW-312-009

Seat Bracket, Front / Rear			
Qty per Assm	Spec	Description	Part Number
3	1/4-20 x 7/8	Hex Head Bolt	HW-250-010
6	1/4	SAE Flat Washer	HW-250-004
3	1/4-20	NyLoc Nut	HW-250-005

Foot Pegs			
Qty per Assm	Spec	Description	Part Number
4	M8 x 1.25 x 50	Socket Head Cap Screw	HW-M08-034
4	M8	Flat Washer	HW-M08-010
4	¾ OD x 1 Long	Spacer	CH-K00-006

Floor Boards			
Qty per Assm	Spec	Description	Part Number
4	M8 x 1.25 x 35	Socket Head Cap Screw	HW-M08-026
4	M8	Flat Washer	HW-M08-010